

Research Group 1995a,b). Declines in smoking prevalence were no greater in program communities than in control communities (COMMIT Research Group 1995b). Although the overall populations in the program communities became more aware of available resources for smoking cessation, the prevalence of smoking cessation among persons who smoked more than 25 cigarettes per day did not differ between program (18.0 percent) and control communities (18.7 percent). Persons who smoked fewer than 25 cigarettes per day were significantly more likely to quit in program communities than in control communities (30.6 vs. 27.5 percent), and that result was attributable to success among light smokers with less than a college education (COMMIT Research Group 1995a).

Statewide Programs

Recent statewide initiatives have integrated tobacco policy and smoking cessation programs. Although Minnesota was the first state to implement a statewide initiative to reduce tobacco use, California has provided what is perhaps the most ambitious example. Massachusetts has also conducted a similar statewide effort based on a tax increase and incorporating a mass media campaign, policy initiatives, and smoking cessation services. These initiatives and others are discussed in detail in Chapter 7.

The state findings are promising. If this success is replicated by other states that adopt a dedicated increase in cigarette excise taxes, or that are able to use resources from settlements with the tobacco industry,

statewide and nationwide initiatives may play an important role in achieving the public health goal of reducing smoking prevalence among U.S. adults to less than 12 percent by the year 2010 (USDHHS 2000).

Summary of Large-Scale Public Health Programs

Community- and media-based programs have the potential to reach large numbers of smokers who are reluctant to seek formal treatment. Such programs could greatly influence smoking prevalence in the United States. The results from major randomized trials and community-based efforts are thus especially disappointing. Though these projects have set new standards for such research and have produced numerous ancillary results of interest, the overall conclusions suggest that even large-scale, well-funded programs may have difficulty promoting changes in smoking behavior. Similarly, the results to date from numerous worksite cessation projects suggest either no impact or a small net effect. On the other hand, results of the California and Massachusetts initiatives (see Chapter 7) suggest that tobacco taxes may be an effective means of funding efforts to reduce tobacco use. The states that have devoted money obtained from Medicaid settlements with the tobacco industry have also had considerable success in implementing a comprehensive approach (Chapter 7). Their results suggest that the disappointing outcomes from research programs may be related to the reach and penetration of these programs and the isolated context in which they were conducted.

Contemporary Issues in Research on Tobacco Addiction

Epidemiologic Concerns and Clinical Issues

Because smoking cessation research has focused more on improving standard paradigms than on innovative approaches (Shiffman 1993b), much of the current energy is directed to pursuing well-trod paths. But current directions have an internal logic, because no new paradigms loom large. Established approaches are perhaps unfairly criticized for lacking innovation. As the foregoing discussion demonstrated, valid methods for treating nicotine addiction are available, but

they must be better understood and can be improved. Despite considerable research on smoking cessation during the past 40 years, the essential elements or combination of elements necessary for successful programs are difficult to extract. In a number of key areas, however, careful research can sharpen interpretation of existing results and provide direction for future investigation and perhaps even innovation.

Nicotine Dependence

Dependence, a central construct in research on drug abuse, has been defined as “self-administration of a psychoactive drug in a manner that demonstrates that the drug controls or strongly influences behavior” (USDHHS 1988, p. 248). Evidence strongly suggests that most smokers are dependent on nicotine (USDHHS 1988). However, most researchers agree that individual smokers differ in the degree to which they are dependent (Fagerström 1978; McMorro and Foxx 1983; Pomerleau et al. 1983; Shiffman 1989; Killen et al. 1992; Niaura et al. 1994). Some occasional smokers may not meet the criteria for physical dependence (Shiffman et al. 1991). These differences in degree of nicotine dependence have important implications for treatment and research.

Flaws in the assessment of nicotine dependence have impeded progress toward understanding its role in smoking cessation. For example, nicotine dependence consists of both physical and behavioral components (USDHHS 1988). However, most smoking cessation researchers have used the term to refer to physical dependence exclusively. Although items in two widely used nicotine-dependence assessment instruments (the Fagerström Tolerance Questionnaire and its successor, the Fagerström Test for Nicotine Dependence) assess the extent to which nicotine controls behavior, the instruments are intended to measure physical dependence (Fagerström 1983; Fagerström and Schneider 1989; Heatherton et al. 1991). Other investigators have measured dependence by how much nicotine smokers typically self-administer (Hurt et al. 1994) or by the severity of withdrawal symptoms (Brigham et al. 1990–91); these two measures are typically not highly correlated with each other, and neither is highly correlated with the Fagerström questionnaires (Kenford et al. 1994). Furthermore, the scales themselves, especially the Fagerström Tolerance Questionnaire, suffer from psychometric limitations (Lichtenstein and Mermelstein 1986; Pomerleau et al. 1989; Tate and Schmitz 1993). In sum, tobacco research is hampered by an inadequate conceptualization of nicotine dependence and an inadequate assessment of the nicotine dependence construct.

Because widely used dependence instruments such as the Fagerström questionnaire are thought to measure physical dependence, it has been hypothesized that they can help identify patients who would benefit from nicotine replacement therapies (Fagerström and Schneider 1989) or from higher doses of these therapies. The evidence for this assertion is mixed, with support somewhat more consistent for the nicotine

gum than for the nicotine patch (Abelin et al. 1989; Fagerström and Schneider 1989; Transdermal Nicotine Study Group 1991; Killen et al. 1992; Kenford et al. 1994; Niaura et al. 1994; Tang et al. 1994). To the extent that current measures capture variation in dependence, they would be expected to predict outcome in trials not using nicotine replacement and in groups of subjects treated with placebo nicotine replacement. Although this hypothesized correlation between dependence measures and outcome has been found in several studies (Fagerström and Schneider 1989), the correlations have tended to be weak (Gritz et al. 1991; Kozlowski et al. 1994) and have usually been significant only at relatively short-term follow-up points (Hall and Killen 1985; Pinto et al. 1987; Gritz et al. 1991; Nørregaard et al. 1993). Specialized assessments of nicotine dependence are not recommended in current treatment guidelines, and pharmacotherapy is recommended for all tobacco users interested in quitting. The one exception is that highly dependent smokers may derive more benefit from 4-mg (as compared with 2-mg) nicotine gum (Fiore et al. 2000).

Other measures of nicotine dependence have been developed, but these have fared no better than the Fagerström questionnaire. For example, the Heaviness of Smoking Index, a derivative, offers no advantage in predicting cessation (Kozlowski et al. 1994). Older measures of smoking motives, such as the Horn-Waingrow Reasons for Smoking Scale (Horn and Waingrow 1966) and McKennell's occasion for smoking scales (McKennell 1970), have good psychometric properties but questionable construct validity (Shiffman 1993a).

Continued reconceptualization of nicotine dependence and improved consensus on mechanisms for measuring it are critical issues for future study. Stronger ties to generic issues of substance abuse—already begun but not discussed in detail here (see Orleans and Slade 1993)—can facilitate such research and improve recognition of behavioral mechanisms that are common to the use of all addictive substances.

Stages of Change

Smokers differ in their motivation to quit smoking, and these differences are thought to affect treatment prognosis. The transtheoretical model, advanced by Prochaska and DiClemente (1983), provides a theoretical structure for assessing these differences and has greatly influenced smoking cessation research in recent years. Briefly, the model proposes that smokers go through a series of stages (not necessarily linearly) on the way to achieving prolonged abstinence from smoking: not thinking seriously about quitting in the

next six months, thinking seriously about quitting in the next six months, planning to quit in the next month, actually trying to quit, and trying to remain abstinent. If relapse occurs, smokers return to an earlier stage in the model. It is hypothesized that smokers in the initial stages are less ready to quit and thus less likely to profit from traditional treatments (see Orleans 1993 for a more detailed discussion).

Some evidence supports the notion that smokers in earlier stages of change fare worse in smoking cessation than do smokers in later stages (DiClemente et al. 1991; Kristeller et al. 1992; Ockene et al. 1992; Rohren et al. 1994). The finding of interactions between treatment assignment and stage membership (Prochaska et al. 1993) has led to the recommendation that clinical protocols for smoking cessation be based on stage assessments (Abrams 1993; Orleans 1993; Velicer et al. 1993; Hughes 1994).

Evidence is not available, however, that linking motivational stage to a stage-appropriate strategy leads to better outcomes than do nontailored interventions of equal intensity (see Prochaska et al. 1993; Fiore et al. 2000), perhaps because motivation to change is more a continuum than a set of discrete states (Lichtenstein et al. 1994). Nonetheless, the stages-of-change model has considerable theoretical and empirical appeal as a typology that is easy to use in day-to-day decision making (Wiggins 1988). Further refinement and clarification of this model, coupled with continued assessment of its relationship to smokers' probability of quitting, is a potentially fruitful research area.

Negative Affect

A negative affective reaction to quitting tobacco use (Baker et al. 1987; Brandon 1994; Hall et al. 1994) may be an important predictor of relapse (Shiffman 1982; Brandon et al. 1990; Piasecki et al. 1997). As mentioned previously, depressed persons are less likely to quit smoking successfully than persons without a history of depression (Glassman et al. 1988; Anda et al. 1990), and depressed persons suffer an increase in symptoms after quitting (Covey et al. 1990; Hall et al. 1991). These related findings have special importance because the frequency of clinical depression among smokers may exceed that among nonsmokers (Frederick et al. 1988; Hall et al. 1991; Brandon 1994).

The role of adverse psychological states—even mild conditions—in prolonging smoking and impeding cessation is an important avenue for further investigation. For example, depressed or otherwise affectively disturbed persons may require special

interventions to succeed in smoking cessation; at least two studies have identified behavioral treatments that have boosted success rates among such persons (Zelman et al. 1992; Hall et al. 1994). As noted, antidepressants and anxiolytics have been proposed as smoking cessation aids and are undergoing clinical trials because of their ability to ameliorate negative affects.

Sex-Specific Differences

Some studies (Pomerleau et al. 1991; Kenford et al. 1993; Swan et al. 1993), but not all (Derby et al. 1994; Whitlock et al. 1997; Gritz et al. 1998), have suggested that women find it more difficult than men to quit smoking. The quit ratio (the proportion of persons who have quit smoking out of those who ever smoked) has increased at the same rate or at a faster rate among women than men in recent years (Fiore et al. 1989; Giovino et al. 1994; Husten et al. 1996). An extensive review of difference in nicotine effects between men and women (Perkins et al. 1999) cites complex differences in psychological and biologic aspects in the maintenance of nicotine self-administration. Women may differ from men in the response to withdrawal, possibly mediated by menstrual cycle phase (Perkins et al. 2000), as well as a variety of nonnicotine effects (Perkins et al. 1999). For example, although the same treatments benefit both women and men, some treatments (e.g., nicotine replacement therapies) may be less efficacious in women (Perkins 1996; Wetter et al. 1999; Fiore et al. 2000). Other reviews of this phenomenon (Fant et al. 1996; Christen and Christen 1998) confirm the need for further exploration of such differences.

A further difference between men and women may be related to genetic factors, particularly differences by sex in the metabolism of nicotine (Messina et al. 1997; Tyndale et al. 1999). These studies have focused on differences in the roles of enzymes involved in the metabolism of nicotine to cotinine (enzymes CYP2A6 and CYP2D6). The considerable variability in nicotine metabolism appears to be due to variable expression of CYP2A6 (Messina et al. 1997) and may play a role, as yet undefined, in gender response to therapeutic modalities. Other researchers, using studies of twins, have postulated that genetic factors may play a role in predicting which cigarette smokers progress to long-term addiction, an effect that may be stronger for men than for women (Heath et al. 1998).

Withdrawal Symptoms

The vast majority of smokers become physically dependent on nicotine, and these persons commonly

display several withdrawal symptoms when deprived of the substance (Shiffman and Jarvik 1976; USDHHS 1988; Hughes et al. 1991b). Conventional wisdom holds that two persons who have different degrees of nicotine dependence will have different degrees of withdrawal severity when they quit smoking (Fagerström 1978; Gritz et al. 1991; Hughes 1993). Withdrawal symptoms are presumed to give a conflicting (and often canceling) motivation to people who have otherwise been motivated to quit (West 1984; Hughes et al. 1991b). The severity of the withdrawal is thus expected to be a strong predictor of eventual relapse (Gritz et al. 1991; West 1992; Hughes 1993). Some research suggests that the various discomforts of abstinence are valid indicators of eventual relapse (Baker et al. 1987; Anda et al. 1990; Hughes 1992; Zelman et al. 1992). Despite the intuitive appeal of this proposed association, other studies have found an inconsistent relationship between withdrawal severity and relapse (Hughes et al. 1984; Hughes and Hatsukami 1986; Stitzer and Gross 1988; West et al. 1989; Transdermal Nicotine Study Group 1991; Prochazka et al. 1992; West 1992; Hughes 1993). Interpretation of this literature remains complicated because researchers use different instruments to assess withdrawal, sometimes reporting total withdrawal discomfort and other times reporting results on a symptom-by-symptom basis, and because they assess symptomatology at different time points. Improved assessment of withdrawal and consensual definitions, coupled with epidemiologic assessment, may better clarify the critical connection between the withdrawal syndrome and the likelihood of relapse. Recent studies demonstrate that there is considerable between-subject variability in the time course of smoking withdrawal and suggest that more consistent links between withdrawal and relapse may be found if this variability is systematically assessed (Piasecki et al. 1998).

Weight Gain

As noted earlier in the discussion of specific modalities, weight gain is a common concomitant of smoking cessation (Klesges et al. 1989). The average smoker gains 5–10 pounds after cessation, and a small percentage of smokers gain more than 25 pounds (Klesges et al. 1989; Williamson et al. 1991). The concern that smokers express about gaining weight may be great enough to prevent them from attempting to quit (Klesges et al. 1988; Gritz et al. 1989; French et al. 1992). Similarly, persons who quit smoking and who do subsequently gain weight may be more likely to relapse (Wack and Rodin 1982; Hall et al. 1986). Two

prospective studies, however, found that concern about weight did not predict cessation success (French et al. 1995; Jeffery et al. 1997). Innovative strategies have failed to reduce weight gain or to improve abstinence rates among persons concerned about gaining weight (Hall et al. 1992; Pirie et al. 1992). Because weight change is a complex metabolic phenomenon (about which there is a considerable epidemiologic and biologic literature, not reviewed here) that is subject to the interplay of behavioral and pharmacologic influences, further research on the behavior and physiological mechanisms that produce postcessation weight gain may suggest new strategies for dealing with this problem and may provide insights into mechanisms of addiction.

Early Relapse

Three recent reports from four trials of the nicotine patch have found that any smoking during the first two weeks of using either the nicotine or the placebo patch is a strong predictor of relapse at long-term follow-up (Hurt et al. 1994; Kenford et al. 1994; Stapleton et al. 1995). For example, Kenford and colleagues (1994) analyzed data from two patch trials. In both trials, large proportions (97.1 and 83.3 percent) of patients treated with the nicotine patch who smoked during the second week of treatment had relapsed by the six-month follow-up. Early relapse may predict longer-term failure—regardless of the cessation strategy, if any—because physiological and behavioral forces may present their most significant challenges to smokers during the first two weeks they try to quit. Strategies that could shepherd smokers through the first two weeks without a single cigarette might be expected to improve treatment outcome. According to another view, most lapses during the first two weeks of treatment merely identify those smokers who will find it difficult to quit no matter what the intervention. Even if given adjunctive interventions to help them pass this two-week period without smoking, these smokers would be expected to relapse soon after these adjuncts were withdrawn. Research on treatments for persons who are strongly addicted and likely to relapse early (should they attempt cessation at all) is a great challenge for cessation research.

Dose-Response

More intense interventions yield better outcomes (Kottke et al. 1988; Lichtenstein and Glasgow 1992; Fiore et al. 1994c, 2000). Although this general relationship has not been precisely explained, outcomes

may be influenced by a host of structural factors, including session length, session frequency, total number of sessions, and number and types of treatment modalities (e.g., telephone contacts and individual vs. group formats).

More specific issues must be clarified, such as determining what level of adjuvant behavioral support is most cost-effective when used with pharmacotherapy. However, a central question surrounding the use of intensive interventions is whether a greater proportion of smokers can be motivated to enroll in such treatment. Debate over whether program refinements can improve outcomes may be moot, from a public health perspective, if most smokers continue to shy away from—or cannot afford to spend the time or money needed for—intensive interventions (Fiore et al. 1990; Lichtenstein and Hollis 1992). A final area for dose-response research concerns the optimal dose for nicotine replacement. Two recent studies (Jorenby et al. 1995b; Hughes et al. 1999) have found that doubling the normal patch dose does not improve cessation outcomes. There may be some benefit, however, to combining different smoking cessation pharmacotherapies (Blöndal et al. 1999; Jorenby et al. 1999), including two different nicotine pharmacotherapies (Fiore et al. 2000).

Treatment Components

Defining the individual impact of treatment components will require controlled trials that systematically manipulate individual treatment components against a background of constant treatment intensity. As Lichtenstein and Glasgow (1992) have noted, smoking cessation researchers have largely abandoned this line of research because most comparison studies (though not all; see Stevens and Hollis 1989) failed to find significant treatment effects. Nonetheless, until the combined effects of treatment components can be determined, empirical design of multicomponent treatments will be difficult.

Individualized Treatment

Investigators have become increasingly interested in seeking interactions between treatment content and smokers' characteristics. Identifying such interactions would allow individual smokers to be given specific interventions to maximize their chances of attaining long-term abstinence. Although subject-by-treatment interactions have been obtained (Zelman

et al. 1992; Niaura et al. 1994), these relationships remain too elusive to suggest an overall strategic theory. Research that incorporates unconfounded comparisons of specific ingredients may suggest algorithms for matching patient and treatment. In view of the increasing presence of the computer in many people's lives, computer-assisted tailored treatments warrant further exploration. Some tailoring and individualization may be appropriate for older smokers whose other medical problems and pharmacologic treatment must be given special consideration (Rimer and Orleans 1993). Currently, however, there is insufficient evidence to recommend individually tailored interventions (Fiore et al. 2000).

An alternative to treatment matching is the strategy of offering smokers increasingly more intensive treatments as they continue to have trouble quitting (Abrams 1993; Orleans 1993), despite the risk that this strategy will reinforce failure. There is insufficient evidence, however, to recommend such a stepped-care approach (Fiore et al. 2000). Research must first reveal hierarchies of treatment as well as determine when patients should be given more intensive interventions.

Dissemination and the Role of the Clinician

Because self-help and minimal clinical interventions are likely to continue to be the preferred method of cessation for most smokers, innovative strategies must be developed to improve efficacy and delivery (Cohen et al. 1989b; Orleans et al. 1991; Fiore et al. 1995). Some of the most effective of the minimal clinical interventions include the institutionalization of system changes as core components of health care (Glynn and Manley 1993; Fiore et al. 2000). For example, having a screening system in place to identify smokers triples clinician intervention (Fiore et al. 2000).

Dissemination is intimately tied to the willingness of clinicians to advise their patients about smoking. An important area for ongoing research is the investigation of strategies that foster this behavioral role not only among physicians but also among a broad range of health care providers, including dentists, nurses, pharmacists, chiropractors, psychologists, physician assistants, and pulmonary technicians. But it is unlikely that behavioral modification for clinicians would be sufficient to produce the required dissemination. Reimbursement policies, financial incentives, and underlying institutional support are all critical for the effective management of tobacco addiction through clinical interventions (Kaplan et al. 1995; Rothenberg et al. 1998).

Cost-Effectiveness

Ultimately, the test of clinical modalities for treatment of nicotine addiction will be their survival in the current environment of cost containment and managed care. Private insurers are unlikely to embrace such treatment unless "they are convinced that there is a market for such a product and that it is viable financially" (Schauffler and Parkinson 1993, p. 189). For public insurers, demonstration of cost-effectiveness has become the de facto standard for adoption of new technology (G. Wilensky, cited in Schauffler and Parkinson 1993, reference 17), though some may insist on cost-savings, a strict standard of proof, for preventive practices.

Smoking cessation has been called the "gold standard" of cost-effective interventions (Eddy 1992). A number of studies (and several reviews [Elixhauser 1990; CDC 1992; Tsevat 1992]) have addressed issues of cost-effectiveness in behavioral counseling. Cummings and colleagues (1989c) calculated that the cost-effectiveness of brief office counseling during a routine visit ranges from \$705 to \$988 per year of life saved for men and from \$1,204 to \$2,058 for women. The use of nicotine gum increases the cost-effectiveness fourfold. Oster and colleagues (1986) performed a similar study incorporating nicotine gum with brief office counseling. The costs per year of life saved ranged from \$4,113 to \$6,465 for men and from \$6,880 to \$9,473 for women. Both studies noted that these costs compare favorably with those derived for other widely accepted preventive practices. Altman and colleagues (1987) found that self-help materials cost \$22–144 per person who quit, a cessation contest costs \$129–239, and a cessation class costs \$235–399. In the setting of acute myocardial infarction, Krumholtz and colleagues (1993) concluded that a nurse-managed smoking cessation program after myocardial infarction was cost-effective, particularly when compared with other modalities. (These studies are not necessarily reported in standardized dollars and are then only roughly comparable.)

An analysis of the cost-effectiveness of implementing the 1996 Agency for Health Care Policy and Research-sponsored Clinical Practice Guideline *Smoking Cessation* reported that cost per quality-adjusted-life-year saved ranged from \$1,108 to \$4,542. This compares very favorably with \$61,744 for annual mammography for women aged 40–49 years and \$23,335 for hypertension screening in 40-year-old men (Cromwell et al. 1997).

Because smoking during pregnancy is associated with lower birth weight, which in turn has been linked to various adverse outcomes of pregnancy, cessation of

smoking in pregnancy has been the subject of a number of economic analyses. Several of these have been performed in a managed care setting. Using patients in a study performed by the Maxicare Research and Educational Foundation, Ershoff and colleagues (1990) weighed the intervention's programmatic costs against the smoking-related increased costs of medical care incurred by mothers who continue smoking and by their infants. The program consisted of an initial interview, smoking counseling by a health educator, and a series of self-help books mailed to participants. The nonsmoking message was reinforced at prenatal care visits. The investigators concluded that in a health maintenance organization of 100,000 members, the cost savings from the cessation program was \$13,432, the net benefit was \$9,202, and the benefit-to-cost ratio was 3.17:1.

Windsor and colleagues (1988) compared three cessation protocols for women in public health maternity clinics: standard care, standard care combined with use of a cessation manual developed by the American Lung Association, and standard care combined with the use of that manual and a pregnancy-specific manual. At the end of pregnancy, smoking cessation had been achieved by 2 percent, 6 percent, and 14 percent, respectively, of women in the three groups. The investigators calculated cost-effectiveness as the cost per patient divided by the percentage who quit. The respective values were \$104.00, \$118.83, and \$50.93. In a second study (Windsor et al. 1993), the treatment group in a multicomponent intervention involving counseling and support had a cessation rate of 14.3 percent, and the control group had a rate of 8.5 percent. Under varying assumptions, the economic analysis found that benefit-to-cost ratios ranged from 6.72:1 to 17.18:1 and that estimated savings from statewide use of the program ranged from \$247,296 to \$699,240.

Marks and colleagues (1990) estimated the benefits that would accrue from shifting low-birth-weight infants into the normal-birth-weight category, from averting deaths attributable to prematurity, and from avoiding the long-term costs associated with the care of premature infants. They concluded that the ratio of savings to costs would be as high as 6:1. If long-term costs were omitted, the ratio would still be \$3.31 for each \$1 spent. Finally, in a somewhat different approach to the problem, Shipp and colleagues (1992) tried to identify the break-even point for the cost of a smoking cessation program. Under general circumstances, the break-even cost was \$32 per pregnant woman, but this cost varied from \$10 to \$237, depending on the probability of adverse outcomes in various populations.

As Schauffler and Parkinson (1993) point out, economic analyses of smoking cessation are often based on hypothetical populations, start with different assumptions about prevalence and intervention effectiveness, and differ in their estimation of outcomes. Although initial results are encouraging, considerable work is needed to codify the results and make them appealing to insurers and employers. In a recent survey, only 8.6 percent of large corporations in California had even considered using smoking status in their risk ratings, and only 2.2 percent had implemented such a rating. About 20 percent of companies offered plans that covered smoking cessation services (Schauffler and Parkinson 1993). Perhaps observations comparing long-term hospitalized care of smokers and nonsmokers will alter this policy. A recent study estimated that helping one smoker to quit reduces anticipated medical costs associated with acute myocardial infarction and stroke by \$893 over seven years (Lightwood and Glantz 1997). Wagner and colleagues (1995) point out that smokers have consistently

increasing rates of hospitalization over five to six years of follow-up. In contrast, smokers who quit have increased hospitalization during the year in which they quit (probably associated with the medical reason—e.g., emphysema—for quitting in many cases); this rate declines thereafter. The authors note that the cost savings that accrue from reduced utilization would more than pay for effective cessation interventions within three to four years.

The alteration of terminology—from “smoking cessation” to “treatment of nicotine dependence”—acknowledges the need to make cessation activity consonant both with modern medical practice and with the current climate for health care delivery. The current body of evidence suggests that efficacious and cost-effective therapeutic modalities are available and that such consonance can be achieved. Further investigation not only of theoretical cost-effectiveness but also of actual use-effectiveness will have considerable impact on institutionalizing the treatment of nicotine addiction.

Conclusions

1. Tobacco dependence is best viewed as a chronic disease with remission and relapse. Even though both minimal and intensive interventions increase smoking cessation, most people who quit smoking with the aid of such interventions will eventually relapse and may require repeated attempts before achieving long-term abstinence. Moreover, there is little understanding of how such treatments produce their therapeutic effects.
2. There is mixed evidence that self-help manuals are an efficacious aid to smoking cessation. Because these materials can be widely distributed, such strategies may have a significant public health impact and warrant further investigation.
3. Programs using advice and counseling—whether minimal or more intensive—have helped a substantial proportion of people quit smoking.
4. The success of counseling and advice increases with the intensity of the program and may be improved by increasing the frequency and duration of contact.
5. The evidence is strong and consistent that pharmacologic treatments for smoking cessation (nicotine replacement therapies and bupropion, in particular) can help people quit smoking. Clonidine and nortriptylene may have some utility as second-line treatments for smoking cessation, although they have not been approved by the FDA for this indication.

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